***Review problems for quiz:***

1. We are at a carnival. We see a simple game in which we reach our hand in a bag and pick out a token, and written on the token is a prize that we win. There are 20 identical looking tokens, each equally likely (the tokens are replaced after each pick, and the bag is thoroughly shaken). One of the tokens will give the customers a $70 prize, two tokens give the customer $40 prize, three tokens give a $20 prize, four tokens give a $10 prize, and the rest give no prize.
   1. What is the probability that a customer will get at least a $20 prize?
   2. What is the probability that at least 1 of the next 4 customers will get a $20 prize?
   3. What is the probability that the first $40 prize would be the 5th customer in line?
   4. What is the probability that the three customers in front of you all win the $70 prize?

* 1. The last situation just happened, what is the probability that you would win $70?

1. If P(A) = 0.53 and P(B) = 0.28 and P(B|A) = 0.26, find the following:
   1. P(A and B) =
   2. P(A or B) =
2. *For the next question, put the probability statements into notation to help you.*

In a company, 42% of the employees are engineers. The probability of an employee being an engineer **and** having graduated from Virginia Tech is 27%. What is the probability that an employee selected at random is a VT graduate **given that** they are an engineer?

ANSWERS

1. P(70) = ; P(40) = ; P(20) = ; P(10) = ; P(0) = 

a. P(at least 20) = P(70 U 40 U 20) =  +  +  =  = .30

b. P(at least one 20) = 1 – P(20C ∩ 20C ∩ 20C ∩ 20C) = 1 – = 0.4780

c. P(40C ∩ 40C ∩ 40C ∩ 40C ∩ 40) = 

d. P(70 ∩ 70 ∩ 70) = 

e. It would still be  since each draw is independent.

2. P(A) = 0.53; P(B) = 0.28; P(B|A) = 0.26

a. P(A ∩ B) = P(A)∙P(B|A) = (0.53)(0.26) = 0.1378

b. P(A U B) = P(A) + P(B) – P(A ∩ B) = 0.53 + 0.28 – 0.1378 = 0.6722

3. P(E) = 0.42; P(E ∩ VT) = 0.27

P(VT|E) = 